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WO 2003/087367 A3

(54) Title: MEANS AND METHODS FOR THE SPECIFIC INHIBITION OF GENES IN CELLS AND TISSUE OF THE CNS AND/OR EYE

(57) Abstract: Described is a method for the specific modulation of the expression of target genes in cells and/or tissues of the CNS and/or eye, wherein a composition comprising one or more doubled stranded oligoribonucleotides (dsRNA) is introduced into the cell, tissue or organism outside the blood-brain or blood-retina barriers. Furthermore, a method for the identification and validation of the function of a gene is provided, wherein the method provides a test cell, test tissue or test organism, which allow information to be gained on the function of the target gene. In addition, compositions and kits are described useful for those methods. In particular, components and methods for the diagnostic use and/or therapy of disorders related to the CNS and/or eye are provided which are based on RNA interference.

## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/EP 03/04002

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/11 A61K31/713 C12Q1/68 C12N15/86 C12N5/10  
A01K67/027

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N A61K C12Q A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DZITOYEVA S. ET AL.: "Intra-abdominal injection of double-stranded RNA into anesthetized adult Drosophila triggers RNA interference in the central nervous system" MOLECULAR PSYCHIATRY, vol. 6, no. 6, November 2001 (2001-11), pages 665-670, XP008023738 the whole document ---	1-6, 11-18, 32-34, 41, 42, 44-47
X	GAN L. ET AL.: "Specific interference of gene function by double-stranded RNA in neuronal cell lines" SOCIETY FOR NEUROSCIENCE ABSTRACTS, vol. 27, no. 2, 2001, page 2051 XP002259262 the whole document --- -/-	2-6, 11-18, 29, 30, 32, 41, 44-47

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family .

Date of the actual completion of the international search

20 January 2004

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10 FEB 2004

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 03/04002

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
**see FURTHER INFORMATION sheet PCT/ISA/210**
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple Inventions in this International application, as follows:

**see additional sheet**

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6, 11-25, 27-34, 39, 41, 44-47 all partially

Use of one or more double-stranded oligoribonucleotides (dsRNA) for the preparation of a composition for the specific modulation of the expression of one or more target genes in cells and/or tissues of the CNS of a subject, wherein said composition is designed to be applied outside the blood-brain barrier.

A method for the specific modulation of the expression of target genes in cells and/or tissues of the CNS, wherein a composition comprising one or more double-stranded oligoribonucleotides (dsRNA) is introduced into a cell, tissue of organism outside the blood-brain barrier.

Uses, methods, cells, tissues, non-human organisms, diagnostic compositions, kits related thereto.

2. Claims: 7-10, 26, 35-38, 40, 42, 43 all totally; 1-6, 11-25, 27-34, 39, 41, 44-47 all partially

Use of one or more double-stranded oligoribonucleotides (dsRNA) for the preparation of a composition for the specific modulation of the expression of one or more target genes in cells and/or tissues of the eye of a subject, wherein said composition is designed to be applied outside the blood-retina barrier.

A method for the specific modulation of the expression of target genes in cells and/or tissues of the eye, wherein a composition comprising one or more double-stranded oligoribonucleotides (dsRNA) is introduced into a cell, tissue of organism outside the blood-retina barrier.

Uses, methods, cells, tissues, non-human organisms, pharmaceutical and diagnostic compositions, kits related thereto.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although claims 2-31 and 47 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

Although claims 3-31 and 47 are directed to a diagnostic method practised on the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/03/04002

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01 82900 A (THE REGENTS OF THE UNIVERSITY OF CALIFORNIA (US); PARTRIDGE WILLIAM M.) 8 November 2001 (2001-11-08)  the whole document ---	1-3, 5, 6, 11, 12, 16-22, 24, 25, 27-33, 39, 40, 44, 45, 47
Y	WO 00 63364 A (AMERICAN HOME PRODUCTS CORPORATION; PACHUK CATHERINE SATISHCHANDRAN C.) 26 October 2000 (2000-10-26)  page 21 page 39 -page 42; example 3 ---	1-3, 5-12, 16-22, 24-33, 39, 40, 44, 45, 47
Y	WO 01 83729 A (NOVARTIS AG (CH); SCRIPPS RES INST; NEMEROW; VON SEGGERN; FRIEDLANDER) 8 November 2001 (2001-11-08)  the whole document page 17, line 15-17 ---	1-3, 5-12, 16-22, 24-33, 39, 40, 44, 45, 47
A	EP 0 308 066 A (HEM RESEARCH, INC. (US); CARTER WILLIAM A.) 22 March 1989 (1989-03-22) page 2, line 40 page 3, line 28-30 ---	1
A	WO 01 75164 A (WHITEHEAD INST; MAX PLANCK; MIT; MASSACHUSETTS UNIV; TUSCHL; SHARP ET ) 11 October 2001 (2001-10-11) cited in the application the whole document ---	13-15
A	WO 97 20579 A (SMITHKLINE BEECHAM PLC (GB); PRICE JACK) 12 June 1997 (1997-06-12) the whole document ---	21, 23
A	WO 98 22132 A (VISSUM RES DEV CO HEBREW UNIV JERUSALEM; SOREQ FRIEDMAN SEIDMAN KAUFER) 28 May 1998 (1998-05-28) page 15, line 23-26 ---	21, 23
		-/-

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/03/04002

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CARLSON S.D. AND HILGERS S.L.: "Perineurium in the Drosophila (Diptera: Drosophilidae) embryo and its role in the blood-brain/nerve barrier" INTERNATIONAL JOURNAL OF INSECT MORPHOLOGY AND EMBRYOLOGY, vol. 27, no. 2, April 1998 (1998-04), pages 61-66, XP002259381 the whole document	
X	WO 01 36646 A (CANCER RES CAMPAIGN TECH LIM (GB) ZERNICKA-GOETZ; WIANNY; EVANS GLOVER) 25 May 2001 (2001-05-25) page 15 -page 18	1,2,5-7, 11-31, 33,39, 40,44, 45,47
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A	LAWSON S.S. AND JOHNSON C.: "Understanding the Glaucoma gene" MOLECULAR BIOLOGY OF THE CELL. 40TH AMERICAN SOCIETY FOR CELL BIOLOGY ANNUAL MEETING; SAN FRANCISCO, CA, USA; DECEMBER 9-13, 2000, vol. 11, no. supplement , December 2000 (2000-12), page 14a XP008023805 Abstract 69 the whole document	

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